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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 060067

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

MANAGER, THEATER 0-98.54

B-251 or S-30

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EDUCATION & WELFARE
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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR THEATRE MANAGER 0-98.54 B-251 or S-30

Summary

During August and December 1951, the entire GATB with the exception of Part E was administered to 36 men employed as Theatre Manager 0-98.54 by the Penn-Paramount and Comerford Publix Corporation at Wilkes-Barre, Pennsylvania. Four managers were eliminated from the sample because of incomplete criterion data, resulting in a final sample of 32. Nineteen were employed by the Penn-Paramount Chain and 17 were employed by the Comerford Publix Corporation. The criterion used consists of rank order supervisory ratings. The aptitudes found to be significant on the basis of mean scores, standard deviations, correlations with the criterion, and job analysis data are Intelligence (G), Verbal Aptitude (V), and Numerical Aptitude (N).

GATB Norms For Theatre Manager 0-98.54 B-251 or S-30

Table I shows the minimum acceptable score for each aptitude included in the test norms for Theatre Manager 0-98.54.

TABLE I

Minimum Acceptable Scores for B-251 or S-30

Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	100
V	CB-1-J	95
N	CB-1-D CB-1-I	110

Effectiveness of Norms

The data in Table V indicate that 7 of the 10 poor workers, or 70% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 70% of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 20 of the 23 workers who made qualifying test scores, or 87%, were good workers.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Theatre Manager 0-98.54.

II. Sample

The entire GATB with the exception of Part E was administered to 36 men employed as Theatre Manager 0-98.54 by the Penn-Paramount and Comerford Publix Corporation at Wilkes-Barre, Pennsylvania during August and December 1951. Four managers were eliminated from the sample because of incomplete criterion data, resulting in a final sample of 32. Nineteen were employed by the Penn-Paramount Chain and 17 were employed by the Comerford Publix Corporation. The two corporations were combined until approximately two years ago. Since the jobs are comparable, the entire group of 32 managers is treated as one sample. Three men in the sample were not able to take the apparatus tests because of physical handicaps.

Men are selected for this job by a procedure of upgrading from Usher to Assistant Manager to Manager. A personal interview is given to all new applicants for the position of usher. Personality and appearance of applicants are considered. No tests are used. To fill vacancies for Assistant Managers, ushers whose performance has been very good and who show promise of success are selected. No specific amount of experience as an usher is required. There is a minimum educational requirement of high school graduation.

Table II shows the means, standard deviations, ranges, Pearson product-moment correlations with the criterion, and the standard errors of correlation for age, education, and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, Pearson Product-Moment Correlations with the Criterion (r), and the Standard Errors of Correlation (σ_r) for Age, Education and Experience

Theatre Manager 0-98.54
N=32

	M	σ	Range	r	σ_r
Age (years)	31.406	7.512	19-44	.384	.151
Education (years)	12.375	1.083	11-16	-.032	.177
Experience (months)	103.344	87.506	5-336	.331	.157

The means and standard deviations for age and education appear to indicate that this is a fairly young group of men, mostly high school graduates. A wide range for experience is shown. The correlations of age and experience with the criterion appear to indicate that some of the older men, who have been with the company for a number of years are considered more successful. This seems logical, since the company is free to hire and fire and would dispense with the services of those men who had not demonstrated sufficient ability to perform satisfactorily the duties of the position over a number of years. Therefore, the fact that some of the older men have been with the organization for a number of years would in itself be evidence that they are successful. There is no correlation between education and the criterion. Since the criterion consisted of supervisory ratings it was not believed advisable to attempt a statistical correction to nullify the influence of age and experience.

III. Job Description

Theatre Manager 0-98.54

Job Summary: Supervises all theatre personnel. Prepares a weekly payroll and pays employees for their services. Books and schedules pictures. Promotes public interest in the theatre showings, using various advertising media. Inspects the entire program on the opening day of each new show. Supervises theatre maintenance, supplies and equipment. Performs routine inspection duties. Oversees preparations for theatre openings. Checks on theatre conditions while show is in operation. Closes box office and concession stand. Checks box office receipts. Closes theatre.

IV. Experimental Battery

All of the tests of the GATB, with the exception of Part E, were administered to the sample group.

V. Criterion

The criterion chosen consisted of rank order supervisory ratings. Several sets of ratings were submitted by various supervisors; however, none of the supervisors could rate everyone in the sample. Finally, supervisory ratings were obtained from the Assistant to the General Manager of the Penn-Paramount Corporation. Since the two corporations were combined until approximately two years ago, this man was able to rate 32 of the sample. His ratings, in combination with the ratings of several supervisors were treated with the formula for changing order of merit ranks into linear numerical scores. However, none of the combined ratings discriminated as well as the supervisory ratings of this man alone. It was decided to eliminate from the sample the four people who could not be rated by this man, and his ratings were used as the criterion.

VI. Statistical and Qualitative Analysis

Table III shows the means, standard deviations, Pearson product-moment correlations with the criterion, and the standard errors of correlation for the aptitudes of the GATB. Table IV shows the means, standard deviations, standardized means, standardized standard deviations, Pearson product-moment correlations with the criterion, and the standard errors of correlation for the tests of the GATB.

The means and standard deviations of the aptitudes and standardized means and standard deviations of the tests are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations with the Criterion (r), and Standard Errors of Correlation (σ_r) for the Aptitudes of the General Aptitude Test Battery

Theatre Manager 0-98.54
N=32

	Aptitude	M	σ	r	σ_r
G	Intelligence	115.406	13.052	.307	.160
V	Verbal Aptitude	110.500	14.071	.313	.159
N	Numerical Aptitude	125.750	13.814	.204	.169
S	Spatial Aptitude	103.563	15.680	.116	.174
P	Form Perception	106.250	17.349	.031	.177
Q	Clerical Perception	104.875	9.800	-.119	.174
A	Aiming	107.563	13.845	-.105	.175
T	Motor Speed	114.531	14.607	-.001	.177
*F	Finger Dexterity	105.448	21.518	-.166	.181
*M	Manual Dexterity	107.172	18.875	-.112	.183

*N=29
Three men in the sample were not able to take the apparatus tests because of physical handicaps.

TABLE IV

Means (M), Standard Deviations (σ), Standardized Means (M'), Standardized Standard Deviations (σ'), Pearson Product-Moment Correlations with the Criterion (r), and the Standard Errors of Correlation (σ_r) for the Tests of the General Aptitude Test Battery

Theatre Manager 0-98.54
N=32

Test	M	σ	M'	σ'	r	σ_r
A Tool Matching	22.625	4.794	105	17	-.079	.175
B Name Comparison	75.875	9.800	105	10	-.119	.174
C H Markings	45.344	4.774	103	13	-.048	.176
D Computation	36.656	5.170	126	14	.139	.173
F Two-Dimensional Space	22.375	8.302	99	20	.037	.177
G Speed	149.438	17.600	113	17	.193	.170
H Three-Dimensional Space	19.031	5.486	104	16	.125	.174
I Arithmetic Reason	12.094	2.428	120	14	.254	.165
J Vocabulary	25.719	6.496	111	14	.312	.160
K Mark Making	76.875	7.837	112	16	-.155	.173
L Form Matching	28.688	7.514	106	19	.242	.166
*M Place	91.517	9.423	108	23	-.116	.183
*N Turn	101.897	7.420	102	17	-.151	.181
*O Assemble	29.414	4.803	108	21	-.181	.180
*P Disassemble	29.724	4.076	99	22	-.085	.184

*N=29
Three men in the sample were not able to take the apparatus tests because of physical handicaps.

The statistical results were analyzed in the light of significant aptitude requirements as indicated in the job analysis. Aptitudes G, V, and N appear to be most important on this basis. Aptitude G is required in the ability to supervise the theatre personnel and keep the theatre operating smoothly. Aptitude V is required in dealing with the public and in utilizing various advertising facilities. Aptitude N is required in preparing the payroll and in checking the box office receipts.

Aptitudes G, V, N, and T have the highest mean scores for this sample. All of the standard deviations are below the general population norm of 20 except the standard deviation for aptitude F which is 21.518. None of the aptitudes correlates significantly with the criterion. The fact that the criterion had been influenced by experience might have depressed the obtained validity coefficients.

Aptitudes G, V, N, and T appear to deserve consideration for inclusion in the test norms. Aptitude T was eliminated because it did not appear important in terms of job analysis information.

On the basis of all the foregoing considerations, aptitudes G, V, and N were selected for inclusion in the test norms. The critical scores were set one standard deviation below the mean and rounded to the nearest five point level. The resulting norms consist of aptitudes G, V, and N with critical scores of 100, 95, and 110, respectively. In order to evaluate the norms by means of the tetrachoric correlation and Chi Square techniques, the criterion was dichotomized with approximately one third of the sample in the low criterion group.

Table V shows the relationship between test norms consisting of aptitudes G, V, and N, with critical scores of 100, 95, and 110, respectively, and the criterion. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V

Relationship Between Test Norms Consisting of Aptitudes G, V, and N with Critical Scores of 100, 95 and 110, Respectively and the Criterion for Theatre Manager 0-98.54

N=34

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	2	20	22
Poor Workers	7	3	10
Total	9	23	32

$r_{tet} = .86$ $\qquad$ $\chi^2 = 9.784$

$\sigma_{r_{tet}} = .31$ $\qquad$ $\frac{p}{2} < .005$

The data in Table V yield a tetrachoric correlation coefficient of .86 with a standard error of .31, and a Chi Square of 9.784 which yields a p/2 value of less than .005, indicating that a significant relationship exists between the test norms and the criterion for this sample.

VII. Conclusions

On the basis of all the foregoing considerations, aptitudes G, V, and N with critical scores of 100, 95, and 110, respectively, are recommended as test norms for the occupation of Theatre Manager 0-98.54.